

is not a piece of required information. That is, there is a second drawback that the user cannot easily take out information having a high necessity for the user from a large volume of information in the information filtering.

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SUMMARY OF THE INVENTION

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10 An object of the present invention is to provide, with due consideration to the drawbacks of such a conventional information filtering apparatus, ~~an information filtering~~ ^{a keyword dictionary producing} method and ~~an information filtering~~ ^a apparatus in which ~~an~~ ^a keyword dictionary ~~information filtering~~ ^{produced} is performed with a high precision by ~~an~~ a beginner and information having a high necessity for a user is easily retrieved from a large volume of information.

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15 The object is achieved by the provision of ~~an information~~ ^{a keyword dictionary producing} filtering apparatus, comprising:

information indicating means for indicating pieces of learning information;

learning information control means for receiving a plurality of teaching signals respectively indicating whether
20 one piece of learning information indicated by the information indicating means is necessary or unnecessary and generating pieces of teaching data respectively composed of one piece of learning information and one teaching signal corresponding to the piece of learning information;

25 learning means for performing a learning operation for each

of the pieces of teaching data generated by the learning information control means to produce records indicating whether each piece of learning information indicated by the information indicating means is judged to be necessary or

5 unnecessary; and

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Keyword dictionary producing
~~Keyword information filtering means for filtering~~ *producing key words from* pieces of

information data according to the records produced by the learning means to arrange the pieces of information data in order of necessity.

- 10 In the above configuration, a user judges whether each piece of learning information indicated by the information indicating means is necessary or unnecessary. That is, in cases where one piece of learning information is necessary for the user, a teaching signal indicating that the piece of
- 15 learning information is necessary is received by the learning information control means. In contrast, in cases where one piece of learning information is unnecessary for the user, a teaching signal indicating that the piece of learning information is unnecessary is received by the learning
- 20 information control means. Thereafter, a teaching data composed of one piece of learning information and one teaching signal is produced for each ^{piece} of ~~the~~ learning information.
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Thereafter, a learning operation is performed for each ^{piece} of ~~the~~ teaching data in the learning unit, and records indicating
- 25 whether each piece of learning information indicated by the

information indicating means is a piece of necessary

information or a piece of unnecessary information are

produced. Thereafter, ^{keywords are produced from} pieces of information data ~~are filtered~~

according to the records in the ^{keyword dictionary producing} ~~information filtering~~ means ~~to~~ ^{for} arrange ^{ing} the information data in order of necessity.

Accordingly, because the pieces of information data can be indicated to the user in order of necessity, information having a high necessity for a user can be easily retrieved from a large volume of information.

Also, the object is achieved by the provision of ^a ~~an~~ ^{keyword dictionary producing} ~~information filtering~~ method, comprising the steps of:

indicating pieces of learning information on an indicating unit;

receiving a plurality of teaching signals respectively

15 indicating whether one piece of learning information indicated on the indicating unit is necessary or unnecessary;

generating pieces of teaching data respectively composed of one piece of learning information and one teaching signal corresponding to the piece of learning information;

20 performing a learning operation for each of the pieces of teaching data to produce records indicating whether each piece of learning information indicated by the information

indicating means is judged to be necessary or unnecessary; and ^{producing keywords from} ~~filtering~~ pieces of information data according to the

^{for} ~~to~~ ^{ing} 25 records ~~to~~ arrange the pieces of information data in order of

high positive value, the summed keyword value for information (not judged as unnecessary data by the user at a high probability) to which many keywords belonging to the keyword set B are attached is a negative and high absolute value, and the keywords attached^{to} each of pieces of information can be converted to the summed keyword value.

Accordingly, a necessity degree of each piece of information judged by the user to be necessary can be predicted by using the summed keyword value. In the present invention, the allocation of values to one or more keywords (including keywords simultaneously occurred) which are attached to unread information indicated in the interface unit 51 is automatically performed according to the unread information and the estimation of a necessity degree or an unnecessary degree performed by the user for the unread information, a necessity signal corresponding to the unread information is calculated with a high precision, and pieces of unread information are arranged in order of necessity with a high precision.

In a first embodiment, a plurality of keywords attached to each piece of information are converted to a vector V composed of elements $V(1), V(2), \dots, V(\text{nofDCK})$, an auto-correlation matrix My of the vector is calculated in cases where the information is judged by the user to be necessary, and a length SY of the vector V is calculated as follows.